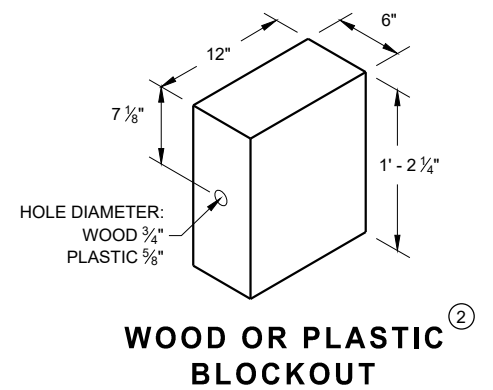
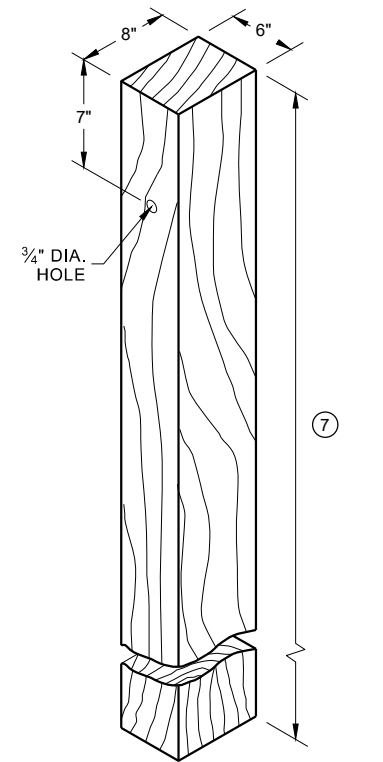
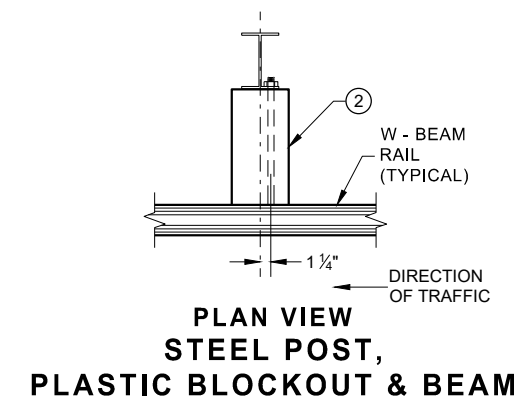
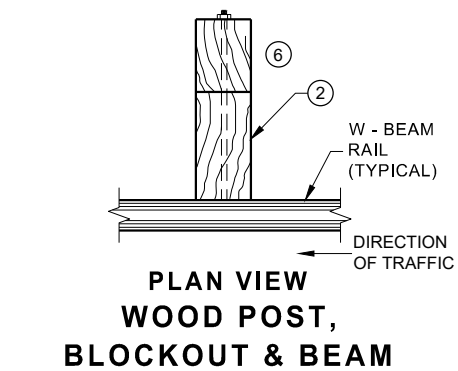
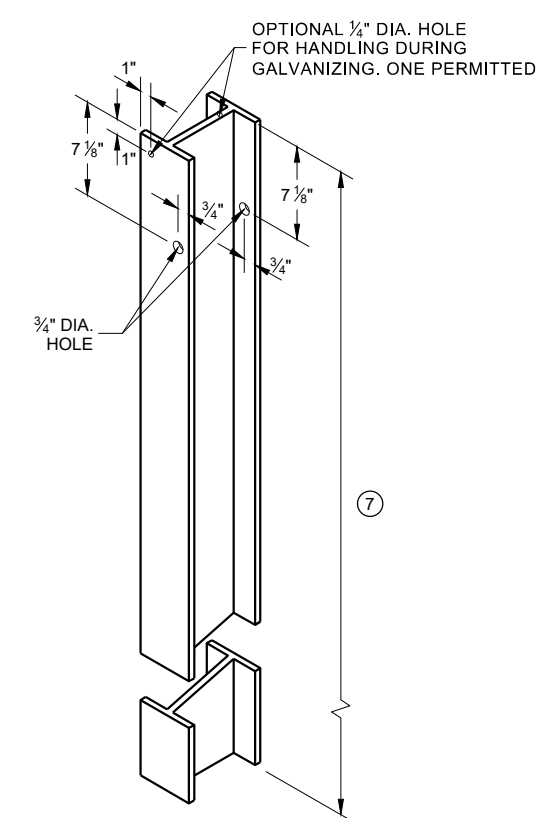
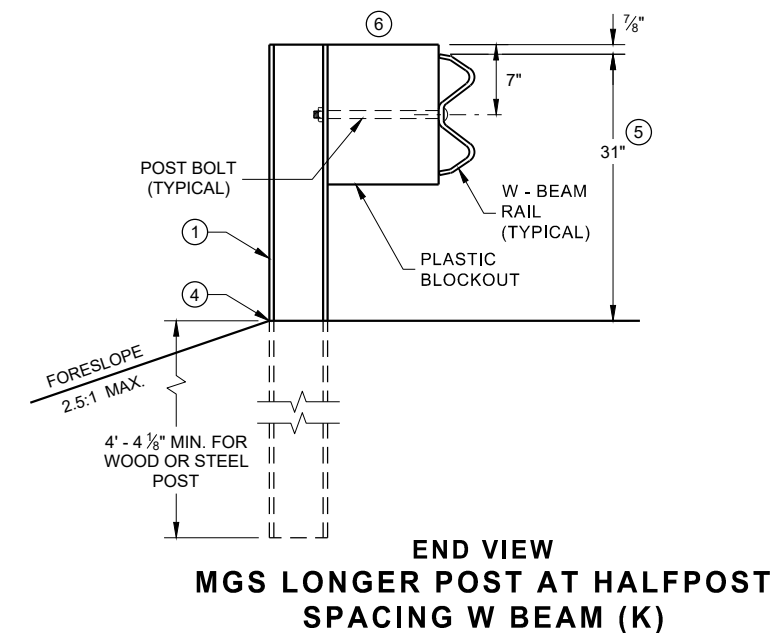
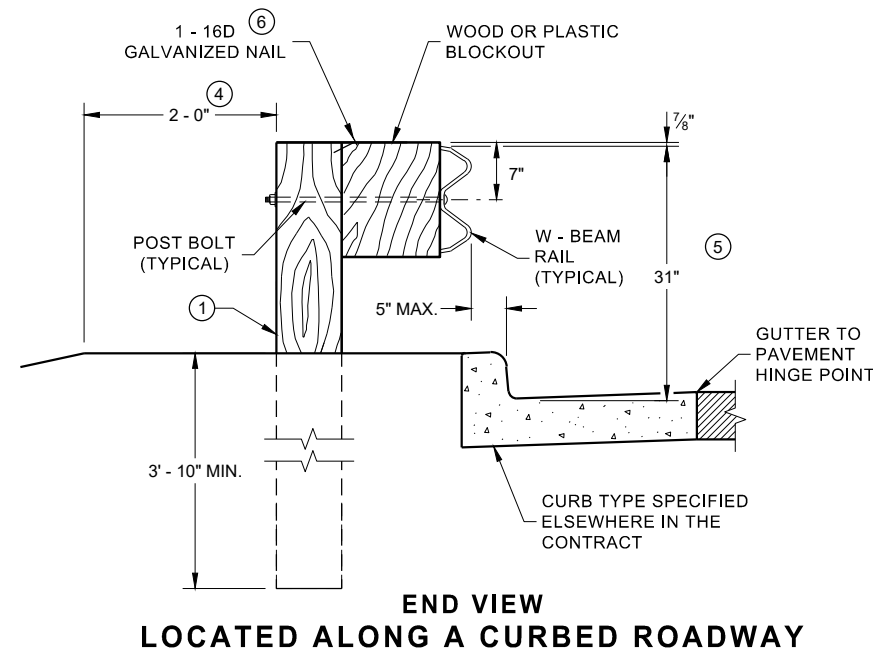
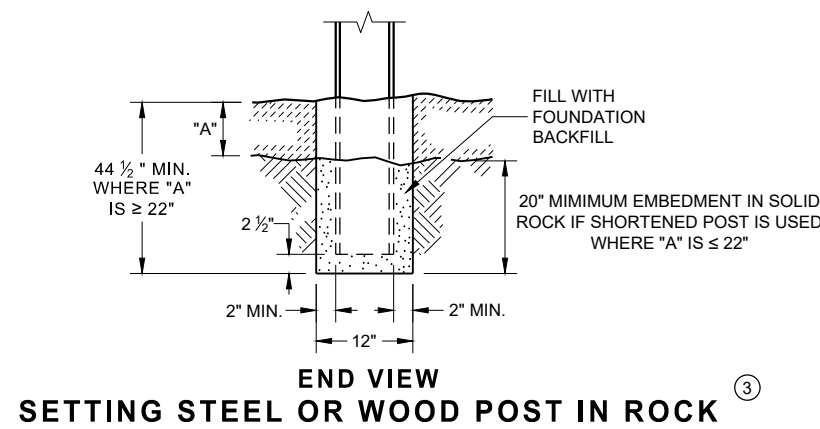


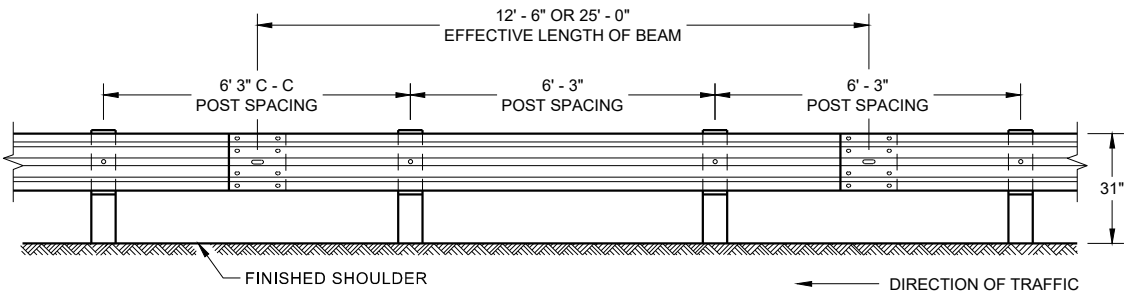
SDD 14B42-a Midwest Guardrail System (MGS) Guardrail

- ① WOOD OR STEEL POSTS (w6X9 OR w6X8.5) MAY BE USED. DO NOT INTERMIX WOOD AND STEEL POSTS. INSTALL STEEL POSTS WITH HOLES ON APPROACHING TRAFFIC SIDE.
- ② USE WOOD OR APPROVED PLASTIC BLOCKOUTS. WOOD BLOCKOUTS MAY BE CONSTRUCTED OUT OF TWO OR MORE WOOD BLOCKOUTS. SEE ALTERNATE WOOD BLOCKOUT DETAIL. DIMENSIONS OF APPROVED PLASTIC BLOCKOUTS MAY VARY.
- ③ IF ROCK IS ENCOUNTERED DURING EXCAVATION, PROVIDE A HOLE 12 INCHES IN DIAMETER EXTENDING 20 INCHES DEEP INTO THE ROCK. PLACE APPROXIMATELY 2 1/2" INCHES OF GRANULAR MATERIAL IN THE BOTTOM OF THE HOLE. CUT THE POSTS THE TO LENGTH AND INSTALL. BACKFILL WITH EXCAVATED MATERIAL AND COMPACT. BACKFILL IS TO BE FREE OF LARGE ROCKS.
- ④ WHEN THE DISTANCE FROM BACK OF POST TO SHOULDER HINGE POINT IS LESS THAN 2 FEET INSTALL LONGER POST AT HALF POST SPACING (K).
- ⑤ FOR NEW MGS INSTALLATION TOP OF W-BEAM RAIL TOLERANCE IS $\pm 1"$. FOR EXISTING MGS INSTALLATION TOP OF W-BEAM IS BETWEEN 27 3/4" TO 32".
- ⑥ WHEN USING STEEL POST AND WOOD BLOCKOUTS INSTALL FOUR 16D GALVANIZED NAILS. INSTALL NAILS AT THE BACK CORNERS OF THE BLOCK AND BEND THE NAILS OVER THE FLANGE OF THE STEEL POST.
- ⑦ TOTAL POST LENGTH FOR TYPE K IS 7' - 0". TOTAL POST LENGTH FOR OTHER MGS TYPES IS 6' - 0".

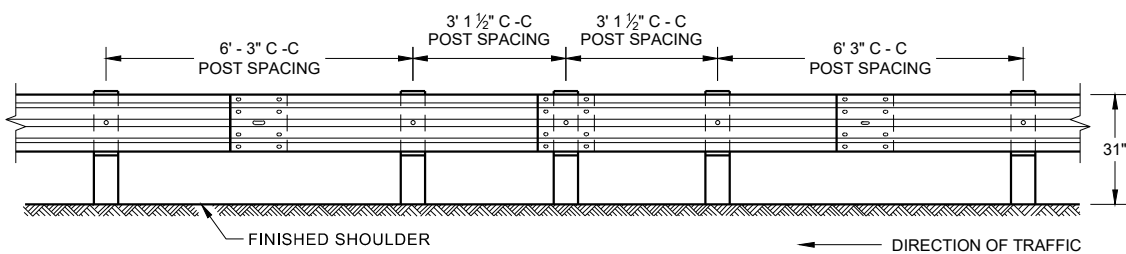


**MIDWEST GUARDRAIL SYSTEM
(MGS) GUARDRAIL**

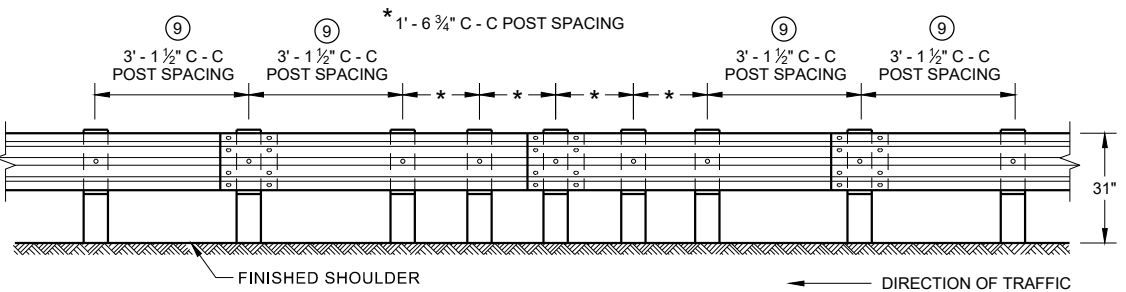
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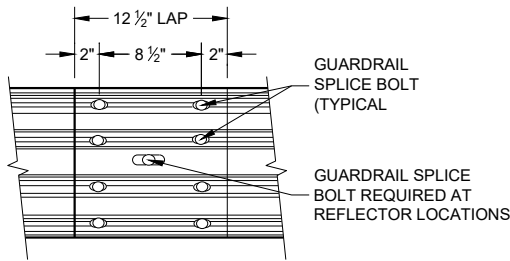
**FRONT VIEW
POST SPACING STANDARD INSTALLATION**



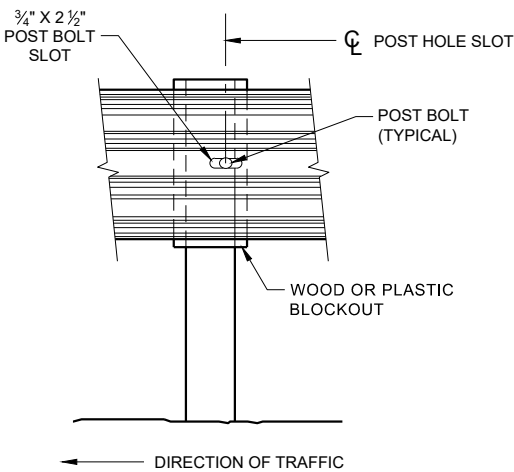
**FRONT VIEW
HALF POST SPACING (HS) AND
HALF POST SPACING WITH LONGER POSTS (K)**



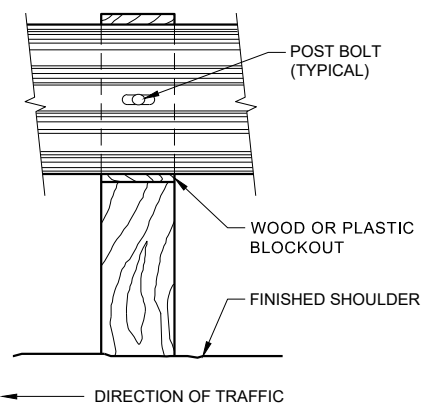
**FRONT VIEW
QUARTER POST SPACING (QS)**



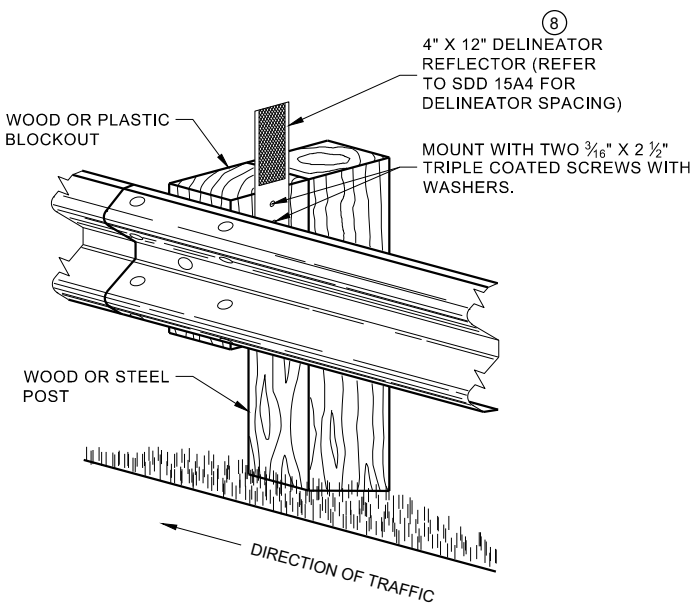
**FRONT VIEW
MID-SPAN BEAM SPLICE**



FRONT VIEW AT STEEL POST



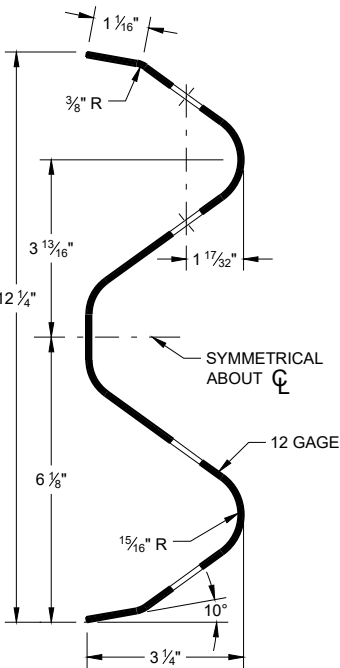
FRONT VIEW AT WOOD POST



**ONE SIDED REFLECTOR DETAIL
AND TYPICAL INSTALLATION**

GENERAL NOTES

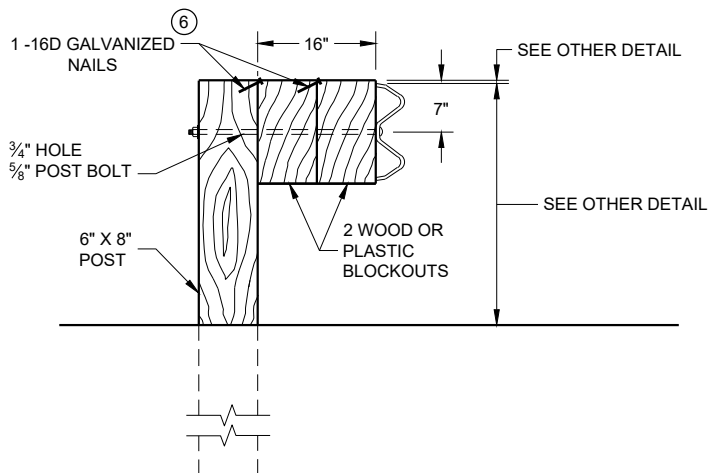
- 8 DO NOT INSTALL REFLECTORS ON THE FIRST 50 FEET OF THE APPROACH END OF THE ENERGY ABSORBING TERMINAL.
- 9 25 FEET OF HALF POST SPACING IS REQUIRED ON APPROACH AND DEPARTURE ENDS OF QUARTER POST SPACING.
- POST BOLTS ARE A 3/4" DIAMETER ASTM A307 GUARDRAIL BOLT. A POST BOLT REQUIRES 3/4" DIAMETER A563A DOUBLE RECESSED (DR) HEAVY HEX NUT AND 3/4" DIAMETER F844 FLAT WASHER. POST BOLTS MAY BE LONGER IF MULTIPLE BLOCKOUTS ARE BEING USED.
- GUARD RAIL SPLICE BOLTS ARE A 3/4" DIAMETER ASTM A307 GUARDRAIL HEAD BOLT. A GUARDRAIL SPLICE BOLT REQUIRES 3/4" DIAMETER A563A DOUBLE RECESSED (DR) HEAVY HEX NUT.



SECTION THRU W-BEAM RAIL

**MIDWEST GUARDRAIL SYSTEM
(MGS) GUARDRAIL**

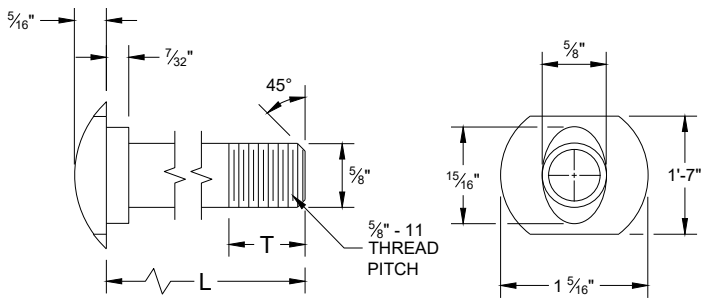
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DETAIL FOR 16" BLOCKOUT DEPTH

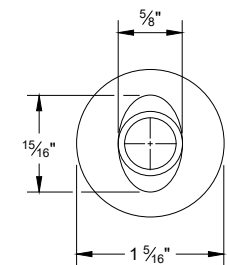
IT IS ACCEPTABLE TO USE BLOCKOUTS UP TO 16" DEEP TO INCREASE THE POST OFFSET TO AVOID UNDERGROUND OBSTACLES. THERE IS NO LIMIT TO THE NUMBER OF POSTS THAT CAN HAVE ADDITIONAL BLOCKOUTS UP TO 16" DEEP.

- NOTE:
- 1. ALL FILLETS SHALL HAVE A MINIMUM RADIUS OF $\frac{3}{16}$ ".
 - 2. IF THE BOLT EXTENDS MORE THAN $\frac{1}{4}$ " FROM THE NUT THE BOLT SHOULD BE TRIMMED BACK.

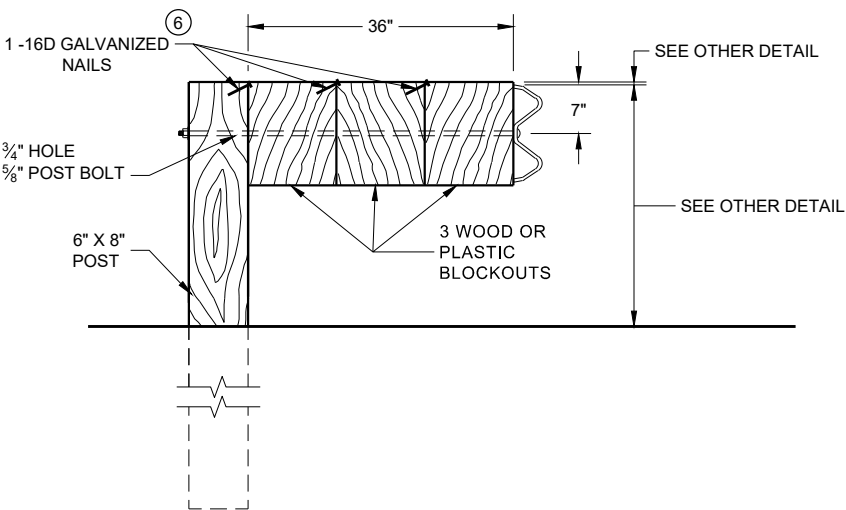


POST BOLT TABLE

L	T (MIN.)
1 1/4"	1 1/8"
2"	1 3/4"
10"	4"
14"	4 1/16"
18"	4"
21"	4 1/16"
25"	4"



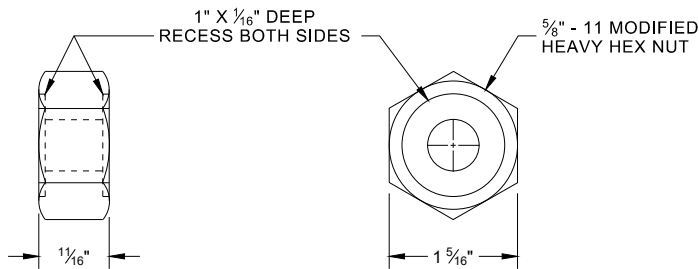
ALTERNATE BOLT HEAD



DETAIL FOR 36" BLOCKOUT DEPTH

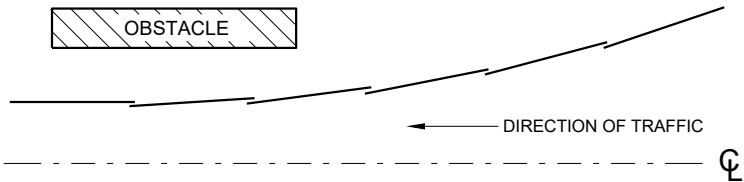
NOTES: UNDER SPECIAL CIRCUMSTANCES, SUCH AS AVOIDING OBSTACLES THAT ARE NOT RELOCATED, IT IS ACCEPTABLE TO INSTALL ADDITIONAL BLOCKOUTS TO OBTAIN UP TO 36" DEPTH FOR ONE OR TWO POSTS IN A SECTION OF GUARDRAIL.

DO NOT USE 16" OR 36" BLOCKOUTS IF IT CAUSES THE POST TO BE DRIVEN BEYOND SHOULDER HINGE POINT OR CAUSES A FIXED OBJECT TO BE WITHIN THE DEFLECTION DISTANCE OF THE BARRIER.

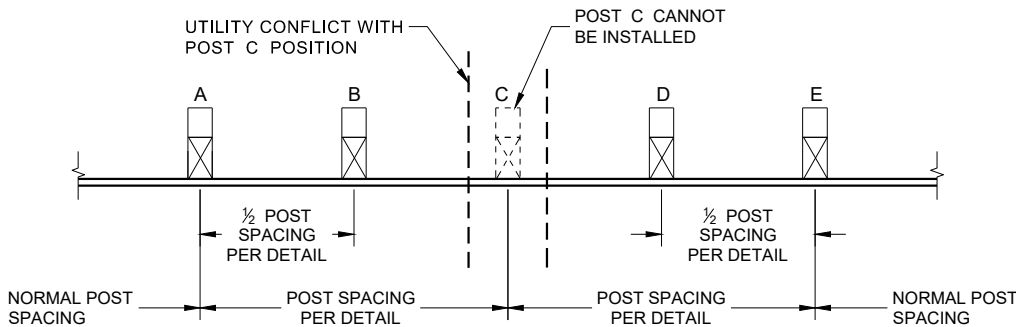


POST BOLT, SPLICE BOLT
AND RECESS NUT

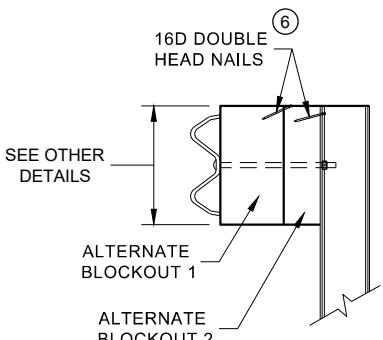
- 6 WHEN USING STEEL POST AD WOOD BLOCKOUTS, INSTALL FOUR 16D GALVANIZED NAILS. INSTALL NAILS AT THE BACK CORNERS OF THE BLOCK AND BEND THE NAILS OVER THE FLANGE OF THE STEEL POST.



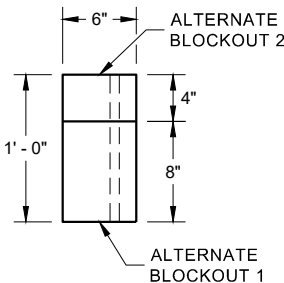
PLAN VIEW
BEAM LAPPING DETAIL



POST DRIVING FOR CONTINUOUS
UNDERGROUND OBSTRUCTION



SIDE VIEW



PLAN VIEW

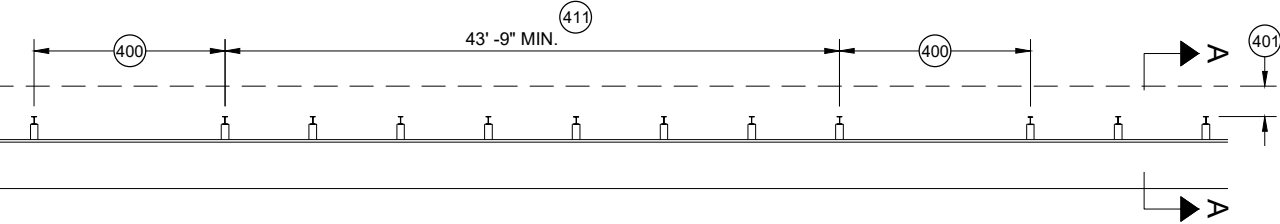
ALTERNATE WOOD
BLOCKOUT DETAIL

MIDWEST GUARDRAIL SYSTEM
(MGS) GUARDRAIL

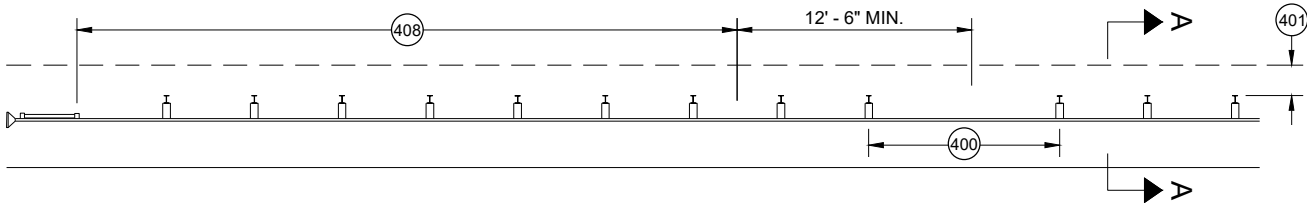
STATE OF WISCONSIN
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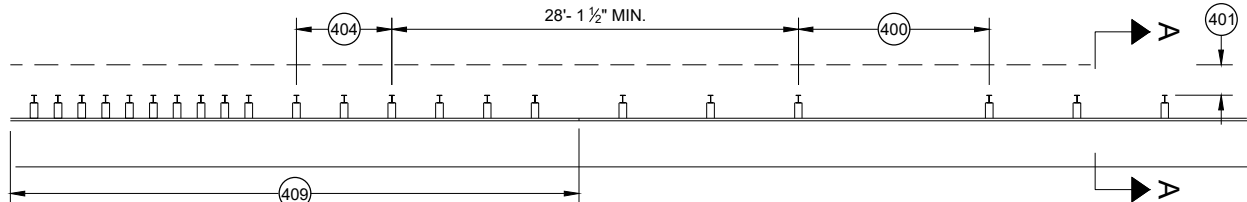
SDD 14B42-d Midwest Guardrail System (MGS) Guardrail



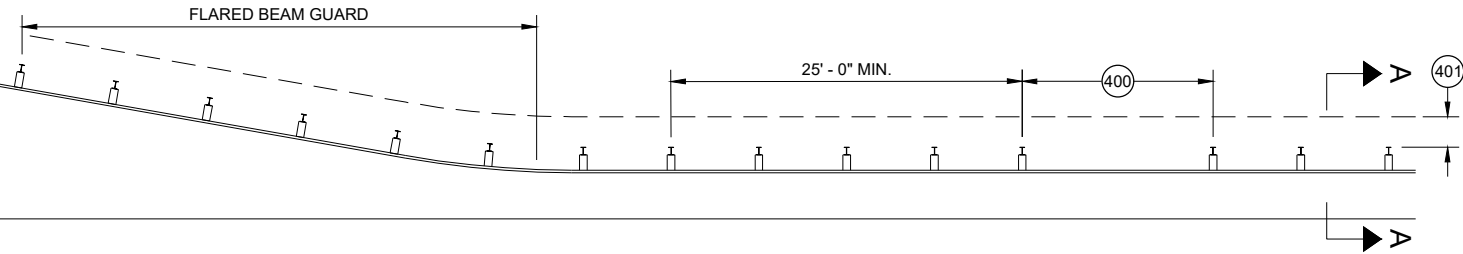
MISSING POST IN MGS GUARDRAIL



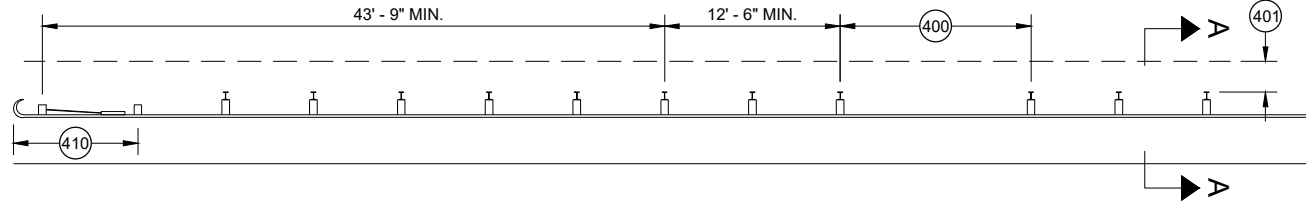
MISSING POST IN MGS GUARDRAIL NEAR EAT



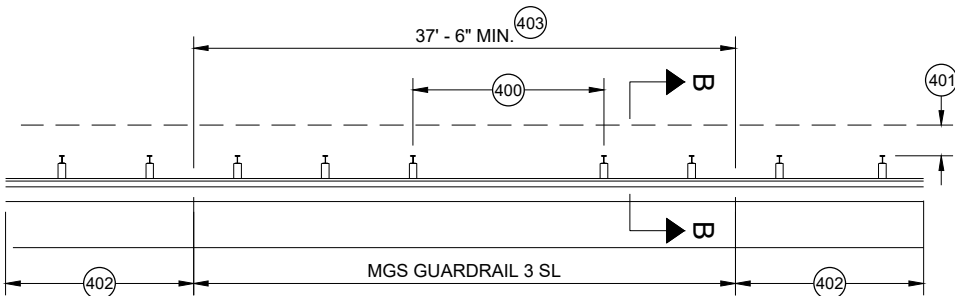
MISSING POST IN MGS GUARDRAIL NEAR AN APPROACH TRANSITION



MISSING POST IN MGS GUARDRAIL NEAR FLARED BEAM GUARD

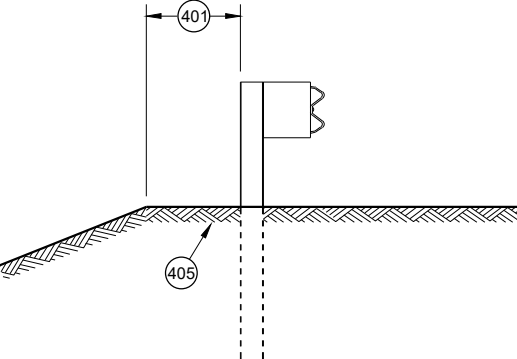


MISSING POST IN MGS GUARDRAIL NEAR A TYPE 2 END TERMINAL

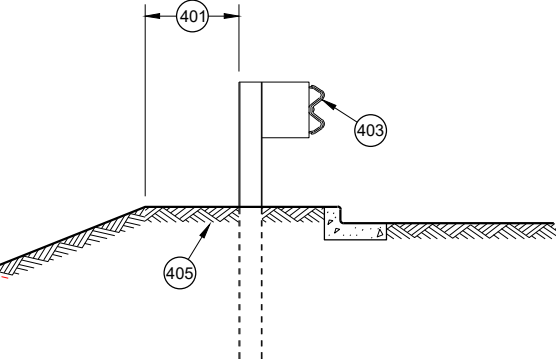


MISSING POST IN SHORT SPAN MGS GUARDRAIL NEAR CURB (SL)

- 400 MAX SPAN 12' - 6"
- 401 2' MIN.
- 402 MGS GUARDRAIL 3
- 403 NESTING BEAM GUARD
- 404 ASYMMETRIC TRANSITION
- 405 SOIL WELL DRAINED AND COMPACTED
- 406 SEE OTHER DRAWINGS IN THIS SDD
- 407 SEE OTHER DRAWINGS FOR MIN. SPACING BETWEEN SPANS
- 408 SEE SDD 14B44
- 409 SEE SDD 14B45
- 410 SEE SDD 14B47
- 411 MINIMUM DISTANCE BETWEEN MISSING POST SPANS.



SECTION A - A



SECTION B - B

MIDWEST GUARDRAIL SYSTEM (MGS) GUARDRAIL

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED
May 2021
DATE
/S/ Rodney Taylor
ROADWAY STANDARDS DEVELOPMENT
UNIT SUPERVISOR
FHWA

*Midwest Guardrail System (MGS) Guardrail***References:**[Standard Spec 614](#)[FDM 11-45-30](#)

CMM 625

AASHTO Roadside Design Guide

MwRSF Report TRP-03-136-03, MwRSF Report TRP-03-139-04,

MwRSF Report TRP-03-157-04, MwRSF Report TRP-03-165-07,

MwRSF Report TRP-03-170-06, MwRSF Report TRP-03-171-06

MwRSF Report TRP-03-172-06, MwRSF Report TRP-03-185-10

MwRSF Report TRP-03-188-08, MwRSF Report TRP-03-191-08

MwRSF Report TRP-03-205-09, MwRSF Report TRP-03-221-09,

MwRSF Report TRP-03-234-10, MwRSF Report TRP-03-237-10

MwRSF Report TRP-03-241-11, MwRSF Report TRP-03-243-11

MwRSF Report TRP-03-255-12, MwRSF Report TRP-03-271-12

MwRSF Report TRP-03-272-13, MwRSF Report TRP-03-274-12

MwRSF Report TRP-03-276-13, MwRSF Report TRP-03-314-15

MwRSF Report TRP-03-320-16 MwRSF Report TRP-03-326-16

MwRSF Report TRP-03-390-20, MwRSF Report TRP-03-393-19

TTI Report 0-4162-2

FHWA Memo W-Beam Guardrail Installations in Rock and in Mowing Strips March 10, 2004

FHWA Memo Roadside Design: Steel Strong Post W-beam Guardrail May 17, 2010

Bid items associated with this drawing:

<u>ITEM NUMBER</u>	<u>DESCRIPTION</u>	<u>UNIT</u>
614.0010	Barrier System Grading Shaping Finishing	EACH
614.0400	Adjusting Steel Plate Beam Guard	LF
614.0920	Salvaged Rail.....	LF
614.0925	Salvaged Guardrail End Treatments.....	EACH
614.0930 – 0939	Salvaged (component)	EACH
614.0950	Replacing Guardrail Posts and Blocks.....	EACH
614.0951	Replacing Guardrail Rail and Hardware.....	LF
614.0952	Replacing Guardrail Reflectors	EACH
614.1000	MGS Guardrail Temporary	LF
614.1100	MGS Guardrail Temporary Thrie Beam Transition	LF
614.1200	MGS Guardrail Temporary Terminal EAT	EACH
614.2300	MGS Guardrail 3	LF
614.2310	MGS Guardrail 3 HS	LF
614.2320	MGS Guardrail 3 QS	LF
614.2330	MGS Guardrail 3 K.....	LF
614.2340	MGS Guardrail 3 L	LF
614.2345	MGS Guardrail 3 SL.....	LF
614.2500	MGS Thrie Beam Transition	LF
614.2610	MGS Guardrail Terminal EAT.....	EACH
614.2620	MGS Guardrail Terminal Type 2.....	EACH

Standardized Special Provisions associated with this drawing:

<u>STSP NUMBER</u>	<u>TITLE</u>
NONE	

Other SDDs associated with this drawing:

SDD 8D1	Concrete Curb, Concrete Curb & Gutter and Ties
SDD 14B28	Guardrail Mow Strip
SDD 14B43	Midwest Guardrail System Long Span (MGS L)
SDD 14B44	Midwest Guardrail System Terminal (MGS)
SDD 14B45	Midwest Guardrail System (MGS) Thrie Beam Transition
SDD 14B47	Midwest Guardrail System (MGS) Type 2 Terminal
SDD 15A4	Deflector Post with Reflective Sheeting (Required)

Design Notes:

Midwest guardrail system (MGS) is a semi-rigid barrier system. MGS is NCHRP 350 or MASH test level 3 compliant. All projects with August 2011 PSE or later are to use MGS details for new beam guard installations.

Indicate in plan where different types of MGS (e.g. HS, QS, K, L...) are to be installed. If the distance from the back of post to the shoulder hinge point is less than 2-feet, install longer post at half post spacing (MGS K) .

Placement of objects that limit post rotation requires approval by BPD. Limited project by project exceptions for placing objects that may limit post rotation may be granted by BPD. However, these exceptions will be rare. Document the exception in DSR.

Contact Person:

Erik Emerson (608) 266-2842